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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/970,921	10/05/2001	Frank Michiels	2428-0108P	3231

2292 7590 03/26/2003

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EXAMINER

FOX, DAVID T

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 03/26/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/972,921

Applicant(s)

Michiels et al

Examiner

FOX

Group Art Unit

1638

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 111; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-14 is/are pending in the application.
- ☐ Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-14 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☒ received in Application No. (Series Code/Serial Number) 09/068,101.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

Office Action Summary

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Claims 1-14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 6,372,960. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to utilize the modified barstar genes including the modification to the second codon, modification of the A-T content, modification of CG and CNG content, particular nucleotide sequence of patent claim 4, or encoding SEQ ID NO:4 which includes alanine as the second amino acid; and methods of their use to inhibit barnase in plants transformed therewith and thus restore male fertility, as claimed in the patent; to obtain the modified barstar genes including the modification to the second codon, modification of the A-T content, modification of CG and CNG content, particular nucleotide sequence of application claim 4, or encoding SEQ ID NO:4 which includes alanine as the second amino acid; and methods of their use to inhibit barnase in plants transformed therewith and thus restore male fertility, as claimed in the instant application.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The application should be reviewed for errors. Errors appear, for example, in claim 9, line 4, where --gene-- should be inserted before "of".

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-2 and 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 412,911 (PLANT GENETIC SYSTEMS) taken with Koziel et al (1993) and Hartley (1993).

The claims are drawn to modified barstar genes which comprise an A-T content of less than 40%, and their use when ligated to tapetum-specific or constitutive promoters to restore fertility in male fertile plants which have been rendered male sterile by expression of the barnase gene, wherein the plants may be rapeseed, cotton, maize, rice or wheat.

PLANT GENETIC SYSTEMS teaches tobacco and rapeseed plant transformation with constructs comprising the *Bacillus amyloliquefaciens* barstar gene of SEQ ID NO:1 (see enclosed Sequence Search) under the control of either a constitutive promoter or the tapetum-specific TA29 promoter, for the production of restorer plants which negate the effect of the previously introduced barnase gene, and so allow for the production and propagation of plants containing the male sterility barnase gene, and suggests the use of the constructs in a variety of plants including corn, wheat and rice (see, e.g., page 7, lines 39-50; page 15 to page 16, line 26; page 18, lines 23-30).

PLANT GENETIC SYSTEMS does not teach the modification of the native barstar gene to encompass less than 40% A-T content.

Koziel et al teach corn plant transformation with a *Bacillus thuringiensis* gene which has been modified to contain a G-C content of about 65% (and therefore an A-T content of about 35%), wherein said modified gene was expressed under the control of either the highly expressed constitutive CaMV 35S promoter or a pollen-specific promoter, and wherein the modified gene

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produced significantly higher amounts of the encoded protein than the native *Bacillus* gene, due to the known preference by maize for G-C-rich sequences (see, e.g., page 194, column 2; page 195; page 199, "Experimental Protocol").

Hartley (1993) teaches that the barstar protein can be modified by substituting a variety of differently-charged amino acids at a variety of residues, without affecting protein function (see, e.g., page 5981, column 2, Table II).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of plant transformation with the barnase/barstar genes under the control of constitutive or tapetum-specific promoters as taught by PLANT GENETIC SYSTEMS, and to modify that method by utilizing corn plants and corn-preferred G-C rich codons as taught by Koziel et al (1993), given the suggestion to do so by PLANT GENETIC SYSTEMS and Koziel et al, and the recognition by those of ordinary skill in the art of retention of barstar protein activity as taught by Hartley (1993).

Claims 3-6 are deemed free of the prior art, given the failure of the prior art to teach or reasonably suggest barstar DNA encoding barstar proteins with Met-Ala as the first two residues, or containing the claimed levels of CG dinucleotides or CNG trinucleotides, particularly in view of the unpredictability inherent in N-terminal sequence modification of plant genes; and given the failure of the prior art to teach or suggest SEQ ID NO:3 or the claimed portion thereof, as stated in parent application Serial No. 09/068,101, now U.S. Patent 6,372,960.

No claim is allowed.

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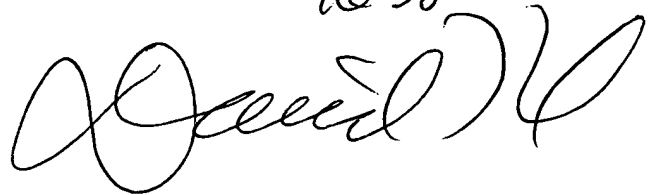
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (703) 308-0280. The examiner can normally be reached on Monday through Friday from 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached on (703) 306-3218. The fax phone number for this Group is (703) 872-9306. The after final fax phone number is (703) 872-9307.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

March 22, 2003

DAVID T. FOX  
PRIMARY EXAMINER  
GROUP 180-1638

A handwritten signature in black ink, appearing to read "David T. Fox", written over the printed name and title.